YG-1 AND THE AUTOMOTIVE INDUSTRY

The automotive industry is always presenting new challenges for the tool manufacturing industry. For example, advanced materials, such as carbon fiber reinforced composites, are machined in the production of today’s electric automobiles and difficult to machine, heat-resistant cast steel turbochargers are produced and assembled to smaller engines for greater power and reduced emissions. Both applications place increased demands for advanced cutting tool material, geometries, and coatings.

YG-1, as a global leader in the manufacturing and application of cutting tools, brings you these innovations worldwide in the form of superior tooling, expert support and world class delivery.
INTRODUCTION

YG-1 has been operating in Germany for the past 15 years with a distribution center in Frankfurt Eschborn and a production facility in Remscheid - all to service the European market.

Today, YG-1 is increasing its presence in Europe by opening the new German R&D Center in addition to R&D Centers currently located in Korea, the USA, and India. The German R&D Center will play a significant role in using the latest technologies to innovate and manufacture cutting tools for the aerospace, energy, and automotive industries.
## GENERAL BREAKDOWN

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
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<td>Turbocharger</td>
<td>(Exhaust Manifold)</td>
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<tr>
<td>Connecting Rod</td>
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<tr>
<td>Wheel Carrier</td>
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<td>Cylinder Block</td>
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<td>Bodywork (Composites)</td>
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<td>Brake Disk</td>
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**Applications**

**Engineering Solution for CYLINDER BLOCK**

**Machining Cylinder Bores**
YG-1 provides a wide range of Indexable Tools for precise boring of cylinder bores - including carbide inserts for roughing and CBN (for higher cutting speed) or carbide inserts for finishing. YG-1 finishing tools feature an advanced cartridge adjustment clamping system that allows for axial adjustment along with lateral (boring diameter) positioning of the CBN insert to meet exact tolerance requirements.

**Face Milling**
Experience the productivity advantages that YG-1’s custom designed PCD Cartridge Milling Cutter provides. It’s an ideal solution for milling large surfaces to precise requirements - such as the cylinder block to cylinder head interface.

**Drilling / Countersinking**
YG-1 manufactures multi-functional tools, such as carbide chamfering drills, designed to save valuable time and money combining two very common operations into one advanced tool.

**Tapping**
YG-1 has a wide range of threading tools and are some of the most innovative in the world. Innovations including special thread geometries to prevent over feeding and multipurpose taps designed to thread a range of materials, including cast aluminum and cast iron, are engineered for use in engine manufacturing.

Please refer to page 25 for explanation about the special cartridge system.

* This workpiece machined using custom tools, that are tailor made to the needs of a specific customer. Please contact YG-1 dealer for more information.
APPLICATIONS

Engineering Solution for CONNECTING ROD

Roughing Operation
Fixed pocket seat (Indexable inserts)

Finishing Operation
Fine adjustable

Roughing/Finishing Boring Tools
YG-1 provides a wide range of Indexable Tools for precise boring of connecting rod openings - including carbide inserts for roughing and CBN inserts for finishing.

YG-1 finishing tools feature an advanced cartridge adjustment clamping system that allows for axial and lateral adjustment for precise size control.

Face Milling
YG-1 offers a range of Indexable Tools with a variety of insert geometries and grades.

YG-1’s indexable milling cutters come in a variety of sizes for shell cutter and shank cutter configurations.

For facing operations, YG-1 offers the Universal YG602 Grade inserts in 90°, square, and octogonal insert shapes (ISO Axxx, Sxxx, Oxxx types)

Solid Milling
YG-1’s End mills are recognized worldwide as the best.

4G Mill and V7 Plus End mills offer a variety of flutes and geometries that address the demands of a wide range of applications.

Drilling / Countersinking
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APPLICATIONS

Engineering Solution for
TURBOCHARGER
EXHAUST MANIFOLD

Slot / Cavity Milling
YG-1’s solid End mills maintain world-class performance. It comes in numerous configurations and geometries as standard products. Even to handle the most heavy-duty applications with ease.

Face Milling
YG-1 offers a range of indexable cutters for facing large areas. YG602 Grade inserts allow for optimal cutting speeds while maintaining accuracy and excellent surface finish.

Multi-Step Boring
Experience the time saving benefits of specially designed tools for machining exhaust manifold and exhaust ports using YG-1’s YG1001/YG3010 Grade inserts for highly heat-resisting material, delivering exceptional results every time.

Inner/Outer Flange Machining
Experience the time saving benefits of specially designed tools for machining exhaust manifold and exhaust ports using YG-1’s YG1001/YG3010 Grade inserts for highly heat-resisting material, delivering exceptional results every time.

Chamfer Drilling

Threading

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APPLICATIONS

GEARBOX HOUSING

1. **Aluminum Side Milling**
   Aluminum is not easy to machine due to long chips, for solid milling, and edge build up, for indexable milling. YG-1’s German Tech Center developed a range of custom PCD tools for machining aluminum. These PCD tools provide a two-fold advantage; extreme cutting speed and the elimination of edge build up. These side milling cutters with staggered cutting edges provide a smooth finish and very high productivity.

2. **Aluminum Face Milling**
   YG-1 offers a special 2 flute cutter with PCD inlays for fast face milling smaller surfaces.

3. **Aluminum Step-Drilling**
   YG-1 has the capability to deliver complete machining solutions tailor made to meet the most challenging demands. This includes complex multi-step drills with PCD inlays for high productivity and trouble free operation.

* This workpiece machined using custom tools, that are tailor made to the needs of a specific customer. Please contact YG-1 dealer for more information.
YG-1 manufactures multi-functional tools, such as carbide chamfering drills, designed to save valuable time and money combining two very common operations into one advanced tool.

Drilling

YG-1 is known world wide as a premier round tool manufacturer and offers multiple series of carbide drills for use in a variety of materials including cast iron.

Chamfer Drilling

YG-1 offers customized tools to meet the challenges of automotive manufacturing. This includes custom tooling such as ganged indexable milling cutters with tangential carbide inserts coupled with a chamfer drill for a single solution to reduce cycle time.

T03 - Tandem Face Milling and Chamfer Drilling

YG-1 offers customized tools to meet the challenges of automotive manufacturing. This includes custom tooling such as ganged indexable milling cutters with tangential carbide inserts coupled with a chamfer drill for a single solution to reduce cycle time.

T01 - One-Shot Inner Boring/Profiling

Experience the time saving benefits of YG-1's specially designed tools for machining steering knuckles. Use YG1001/YG3010 Grade inserts for cast iron to deliver exceptional results every time.

T02 - Bore Finishing

For finishing the inner bore of a wheel carrier to a precise surface finish that meets the rigorous standards of the automotive industry, YG-1 engineers developed a bore finishing tool with PCD inlays customized to meet the end user’s specifications.

* This workpiece machined using custom tools, that are tailor-made to the needs of a specific customer. Please contact YG-1 dealer for more information.
APPLICATIONS

BRAKE DISK

Turning

YG-1 offers a large variety of indexable turning tools and carbide inserts with multiple grades including YG3020 Grade specifically engineered for steel applications. Visit YG-1 online and download the Indexable Cutting Tools catalog, or contact one of many local sales representative to learn more about other options YG-1 can provide.

Chamfer Drilling

YG-1 manufactures multi-functional tools, such as carbide chamfering drills, designed to save valuable time and money combining two very common operations into one advanced tool.

Drilling

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Die & Mold
Modern vehicle body parts such as doors, hoods, and fenders are manufactured with sophisticated dies and molds.

YG-1 offers comprehensive solutions for machining Die & Mold sets used for the production of automotive body parts and many other applications. Scan the provided QR code to access our Die & Mold Solutions brochure.

Composites
More and more, composite materials are becoming increasingly prevalent across the entire manufacturing sector. There is an ever growing trend in the automotive industry to make use of the advanced properties of CFRP (Carbon Fiber Reinforced Plastics), GFRP (Glass Fiber Reinforced Plastics) and other such materials once only the domain of advanced aerospace projects. Prime example of composite materials used outside of aerospace are the various body components for the automotive industry.

In keeping pace with the most cutting-edge technologies and trends, YG-1 has developed a wide range of diamond-coated and PCD cutting tools for a wide variety of composite materials. Scan the provided QR code to access our Composites Materials - Tools Solutions for Industries brochure.
**K Cast Iron**

- **INDEXABLE FACE MILLING AND ROUGHING**
  - **YG MILL** [General & -TR Chipbreaker]

- **SOLID CARBIDE MILLING**
  - **4G MILL**

- **EXCHANGEABLE HEAD SOLID CARBIDE MILLING**
  - **i-SMART**

- **REAMING**
  - CARBIDE REAMERS

**P Steel**

- **INDEXABLE FACE MILLING AND ROUGHING**
  - **YG MILL** [General & -TR Chipbreaker]

- **SOLID CARBIDE MILLING**
  - **PRIME TAPS | THREAD MILLS COMBO TAPS | SYNCHROTAPS**

- **INDEXABLE DRILLING**
  - **YG DRILL** [universal line]

- **SOLID CARBIDE HEAVY CUT MILLING**
  - **V7 PLUS**

- **EXCHANGEABLE HEAD SOLID CARBIDE MILLING**
  - **i-SMART**

- **EXCHANGEABLE HEAD MILLING**
  - **i-Xmill**

- **SOLID CARBIDE DRILLING**
  - **DREAM DRILLS GENERAL**

- **EXCHANGEABLE HEAD MILLING**
  - **DREAM DRILLS HIGH FEED**

- **SOLID CARBIDE DRILLING**
  - **DREAM DRILLS FLAT BOTTOM**

- **SOLID CARBIDE DRILLING**
  - **DREAM DRILLS MQL**

**N Non Ferrous Metals (Aluminum)**

- **SOLID CARBIDE ALUMINUM MILLING**
  - **ALU-POWER**
  - **ALU-POWER HPC**
  - **DREAM DRILLS ALU**

- **INDEXABLE FACE MILLING**
  - **YG MILL** [General & -TR Chipbreaker]

- **SOLID CARBIDE MILLING**
  - **THREAD MILLS SYNCHROTAPS**

- **EXCHANGEABLE HEAD MILLING**
  - **i-SMART**

- **REAMING**
  - CARBIDE REAMERS

- **INDEXABLE DRILLING**
  - **YG DRILL** [universal line]

- **SOLID CARBIDE HEAVY CUT MILLING**
  - **V7 PLUS**

- **INDEXABLE DRILLING**
  - **YG DRILL** [universal line]

- **EXCHANGEABLE HEAD DRILLING**
  - **i-ONE DRILLS**

- **EXCHANGEABLE HEAD DRILLING**
  - **SPADE DRILLS**
CARTRIDGES

Adjustable CBN Insert Cartridge Type A
Pivoting Type

Specially developed for YG-1 precision bore finishing tools. The cartridge carries a replaceable Carbide/CBN/PCD insert and it can be precisely adjusted axially as well as laterally by loosening the locking screw and adjusting the Tool Diameter & Angle of Attack adjustment screws and axial clamp.

This system allows for fine-tuned adjustments to satisfy the most demanding requirements for tight tolerances and exact bore dimensions.

Adjustable CBN Insert Cartridge Type B
Bending Type

YG-1’s new cartridge with indexable carbide, CBN, or PCD inserts mounted and secured by a robust clamping system, offers greater lateral adjustment due to the incorporated bending point.

This cartridge features double locking screws to insure precision while also allowing for additional axial movement. As with previous versions, this cartridge can be axially and laterally adjusted with the corresponding clamps.
HIGH QUALITY PRODUCTS and ON TIME DELIVERY for WORLD-WIDE CUSTOMERS

Since 1982, YG-1 has been committed to quality, innovation and the unique customer experience. Our performance and experience have granted YG-1 the global impression of one of the leading manufacturers of high quality cutting tool solutions. This global footprint expands over 75 countries, with international logistic centers, pledging to our customers to give the best service available today - and tomorrow.

EUROPE
- BELGIUM
- FINLAND
- ITALY
- PORTUGAL
- SLOVENIA
- THE NETHERLANDS
- CROATIA
- FRANCE
- LITHUANIA
- ROMANIA
- SPAIN
- TURKEY
- CZECH REPUBLIC
- GERMANY
- NORWAY
- RUSSIA
- SWEDEN
- UNITED KINGDOM
- DENMARK
- HUNGARY
- POLAND
- SERBIA
- SWITZERLAND

ASIA PACIFIC
- AUSTRALIA
- INDONESIA
- KINGDOM OF SAUDI ARABIA
- SINGAPORE
- UNITED ARAB EMIRATES
- CHINA
- IRAN
- MALAYSIA
- SOUTH KOREA
- VIETNAM
- HONG KONG
- ISRAEL
- PAKISTAN
- TAIWAN
- INDIA
- JAPAN
- PHILIPPINES
- THAILAND

AMERICAS
- BRAZIL
- CANADA
- COLOMBIA
- MEXICO
- UNITED STATES

AFRICA
- EGYPT
- SOUTH AFRICA

* For the more information on sales network, please contact the head office as below: